BUILDING UP WORN-OUT CLAY LANDS.

Paper Read Before North Carolina Farmvers' Conention, Raleigh, July 21, 1903, by E. W. Brawley, Esq., of Iredell County, N. C.

The granite found near Mooresville are generally coarse grained, containing large crystals of feldspar, hornblend gneiss, micacoeus schists and soapstone. When these weather deeply they give the distinctive red or Cecil clay. Another granite is found with diorite, which weathers into a yellow, impervious clay, even more tenacious than the red. These clays seem to have been originally covered with a deposit of gray loam, full of quartz, but on slopes and hillsides,under long cultivations, this has washed and blown to the basins or disappeared down the creeks and rivers, leaving the more tenacious clays exposed.

When these erosions have been going on for some time the soil is erroneously said to be worn out, simply because it does not produce such good crops under the same conditions of tillage as the freshly cleared loam.

Instead of being worn out, they are scratched out, washed and gullied down to the unweathered red clay and this residual red clay soil or subsoil, according to the chemical analysis is richer in mineral matter, especially potash, than the lighter top soils; and the beauty of it is that it usually reaches down from 2 to 15 feet, and often to the fast rock.

Regardless of this chemical fact, we farmers know that these newly exposed clays do not produce crops like the original sandy loam. We also know that it takes both time and labor in abundance to restore them to the original new ground conditions; for the stores of plant food there are in an inert form and must be prepared for the use of the plant. To unlock this inert food for the plants immediate use is termed building up the land.

The more plant food we are able to take out of the land with a crop, the richer the land is said to be. So the building up of worn out lands resolves itself into the most ingenious method of robbing the soil of its inert stores of plant food by remunerative crops.

The drainage of our Piedmont lands is generally good, owing to the character of their formation. Small fragments of stone scattered through the clays give the rains a chance to penetrate if only time is given. The finer the clay particles the more impervious they become, and here some artificial means must be resorted to, such as tile drainage, to let water into the soil and carry off the surplus, stagnant water and avoid frost lifting; filling the soil with humus forming material; deep plowing; frequent cultivation, and dust mulches to let in air and check evaporation. Were it not for our average of about 50 inches of rain pretty evenly distributed throughout the year, we would soon learn more of the true value of these artificial methods.

THE STORY OF AN IREDELL FARM.

In 1895, I bought a worn-out farm of 128 acres, which had been rented for a number of years and was scarcely paying rents. I opened an account with this, "Moore Farm," charging it with every bit of labor, 6 per cent interest and taxes, as well as the original cost.

There was some timber on it, the best of which was at once cut and sold. This brought cash—what I most needed. Some 35 acres were cleared during the winter, put in corn in the spring, and wood delivered in the summer. The best of the old land was put in cotton and the poorer sown in peas. On some of this poorer land I spent as much as $45 per acre in green manures, fertilizers and tillage before anything was taken off.

To-day this farm has a balance to its credit of more than I paid for it originally and a fair growing crop with a crop of wheat is paid for. Last year this farm gave me clear of expenses, just about the amount of the original cost. I have raised 44 bales of cotton in one year, over 400 bushels of corn, and over 600 bushels of wheat on it. I have built up portions of it from mere galls to lands bringing average crops, while other parts have been worked in cotton for the dollar there was in it, thus breaking it down.

It is no model farm, as such are often described: "Three dollars spent for each $1 taken off." I have never spent many cents for looks only, but have been working for the profit there was in it. Often I have had to build my finances up at the expense of everything else.

I have not only kept a general account with this farm, but an individual account with each field and every crop raised; it has been worked entirely by hired labor, under my own supervision. I also keep an account with one other farm which has been rented all the time for five years. The profits there have been from 15 to 25 per cent, and the tenant, a good worker, has made handsome profits also.

Lets turn to the history of some of the individual fields and crops.

A BUSINESS ACCOUNT WITH A 3-ACRE FIELD.

In the fall of 1896 I began on a three-acre piece, half of which was galled off to the red clay subsoil and barren, the other with more gray soil was covered with broomsedge and small pines. This was turned under with a good sized plow and three mules, covering a big roll of briars, weeds and trash hauled and placed in each furrow of the barren part. In December, about seven tons of lime was broadcasted; in spring, land was disk harrowed, and 600 pounds of kainit with 600 pounds of acid phosphate was broadcasted; shallow furrows were drawn about three feet apart and cotton seed planted, with 600 pounds of a complete fertilizer. Late in August crimson clover seed were sown and worked in with cultivator. This lint cost me 13¼ cents per pound.

In the spring of 1898 I replowed and drilled in oats and clover, with 600 pounds of a complete fertilizer. At harvest the clover was clipped off also. The lime, the fertilizer, and the thorough culture of the cotton had given a splendid stand.

During the summer and fall the clover was mown and raked up on the best places only to be scattered on the heavier clays.

The following spring the best was taken for hay, and that on the poorer left where it was mown and all the trimmings of fencerows and ditch banks near by were hauled and scattered there. In August, 1899, this second growth of clover was turned; seed bed well prepared with disk and dray harrows used alternately with a 2,500 pound roller till middle of October, when wheat was drilled in with about 600 pounds of acid phosphate. In March, 1900, a dressing of 150 pounds of nitrate of soda was given. The yield was 84 bushels, or 28 bushels per acre.

After the wheat, peas were put in and all mown for hay; crimson clover was sown at once and turned in the spring of 1901, for a variety test of cotton. Of all the 16 varieties the Improved King gave the best yield of lint. Last year the stalks were dragged, then run around with side plow and plowed out with a heavy team and large straight shovel. A two-horse slant tooth harrow was dragged across the rows to put stalks in the deep trenches, and two furrows were turned back on them and land harrowed with the rows, the corn planter following in every row, as the cotton had been planted in four-foot rows. As the corn was coming up it was again harrowed, regardless of rows, leaving land level. Soon a long narrow bulltongue was run close around the corn and as deep as one horse could pull it, and again ground harrowed with two-horse harrow.

About every ten days two more close, deep furrows were cut off the middle with bulltongue, it taking about eight furrows to finish, and from 40 to 50 days after the corn had been planted. In this time the narrow cultivators had gone around the corn twice.

After the middles were finished, corn from 18 to 24 inches high, nothing but broad cultivators were used cutting about two inches deep until silks appeared, when peas were sown and cultivators run for the last time.

Fodder was taken, including the first blade above the ear, and tops cut later. When corn was gathered it measured 35 bushels per acre.

The stalks while standing were cut into six inch lengths with corn knife, and then the peas and all chopped fine with disk harrow, and oats and vetch sown about 25th of September, with 900 pounds acid and potash, and top dressed in March with 600 pounds high grade complete fertilizer. The yield was at least two tons of cured hay per acre. As a fair stand of volunteer red clover is on the land I am leaving it instead of sowing in peas. This piece of land has paid large profits on all labor spent on it, and will now yield three times the crop it would have made in 1896.

RECORD OF A 15-ACRE LOT.

Bear with me till I give the history of one other piece of 15 acres, which has been in cultivation about 50 years. Most of the top soil had gone to the red clay. When I bought it in 1896 the yield of wheat was 2¼ bushels per acre.

As it was late, peas were scratched in, and in the fall it was broken with two horses, followed by two-horse subsoiler; good rolling, harrowing and fertilizing done, and rye sown. In the spring when rye was in bloom it was turned with a 16-inch plow and three mules, and after the usual harrowing and rolling, peas were drilled in with 400 pounds of acid and potash.

That summer chip manure, scrapings from cotton mill, wood yard with some rich soil, was hauled onto the worst places. In September all was turned under, and everything done to procure a stand of clover sown with the wheat. In the spring the wheat was gone over with weeder and clover seed sown again where it had winter killed. My wheat crop averaged about eight bushels per acre, at a cost of $1.45 per bushels, and the clover failed only in spots. These were mown and scattered over the bald places with other refuse. In 1899, after turning for wheat, several hundred bushels of raw cotton seed were also scattered over these galls. On a fine, smooth seed bed, wheat was drilled in with 300 pounds per acre of a high grade fertilizer. At harvest my yield was a little over 20 bushels per acre.

Land was hastily prepared, fertilized and peas sown for hay and stubble sown in crimson clover.

A fine chance of clover was ready to be turned for cotton in 1901, which was planted and cultivated flat. The field averaged a net profit of $12.58 per acre, and the lint cost me in actual work, after deducting the cash gotten for the seed, $2.53 per hundred. And could I have gotten 48 cents per bushel for my seed, I would have had my lint free of cost. As this cotton was very late in maturing, I decided to plant again in cotton and raise a cheap crop. A deep furrow was run through the middles, then a railroad iron was dragged square across the rows, breaking off the old stalks and dragging them into the furrow, a complete fertilizer was put in and listed on and stalks plowed out. Ridges were then dragged down and rolled where the ground was cloddy, and cotton planted.

This yield was heavier, averaging 315 pounds of lint per acre, at a cost of $2.10—the cheapest cotton I have ever raised. At the second picking last fall rye was sown, as the crimson clover sown in August had burned out. This spring rye was top dressed with a complete fertilizer, 200 pounds per acre. A heavy crop turned under and thorough preparation made for peas sown with 300 pounds acid and potash per acre.